

# TOBACCO AND THE ENVIRONMENT

Tobacco use is not only a health issue — it is also an **environmental issue.**

**4,211,962 cigarette butts** were collected in **beaches and waterways** globally in 2019, making them the world's second most common type of litter after food wrappers.



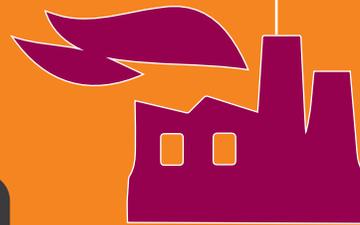
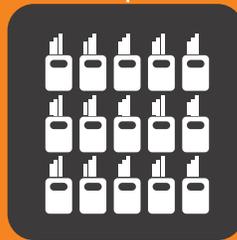
**30%-40%**  
Cigarette butts  
comprise  
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cleanups.

**4,211,962**

**600M**



Approximately **600 million trees** are **chopped down** every year by the tobacco industry. On average each tree produces enough paper for **15 packs of cigarettes.**



**948,327  
POUNDS**



**948,327 pounds** of **toxic chemicals** were released from U.S. tobacco facilities in 2018.



**2.7M  
TONS**



In 2018, Americans generated **2.7 million tons of consumer electronic waste, including e-cigarette waste**, that ultimately ends up in landfills or incinerators.

# TOBACCO AND THE ENVIRONMENT

Tobacco doesn't just negatively impact the health of individuals, it also endangers the health of the environment.<sup>1</sup> When e-cigarette and cigarette waste isn't disposed of properly, it makes its way into the environment where it ends up polluting water, air, and land with toxic chemicals, heavy metals and residual nicotine. An **estimated 766,571 metric tons of cigarette butts make their way into the environment every year.**<sup>2</sup> Additionally, in 2018, Americans generated **2.7 million tons of consumer electronic waste, including e-cigarette waste**, that ultimately ends up in landfills or incinerators.<sup>3</sup>

Given that the largest U.S. cigarette companies sold about 217 billion cigarettes to wholesalers and retailers nationwide in 2018,<sup>4</sup> it's no surprise that **cigarette butts are the most frequently littered item** in U.S. beaches and waterways and second most littered item globally.<sup>16</sup> Cigarette butts are often disposed of in the environment, on streets, sidewalks, and other public areas, and may then be carried as runoff to drains and ultimately end up polluting rivers, beaches, and oceans.<sup>6,7</sup> Because cigarette butts are primarily made of plastic filters that don't biodegrade, the butts that aren't eaten by wildlife simply pile up on shorelines or at the bottom of bodies of water.<sup>8,9-11</sup>

The problem isn't limited to cigarettes. **Retail e-cigarette sales more than doubled, with a 122.2% increase in total units from September 2014—May 2020.** This increase in single-use e-cigarette products will eventually become tons of e-cigarette waste as these products reach end-of-life.<sup>13</sup> Disposing of e-cigarette waste in an environmentally safe and friendly way is a growing problem, especially given the rise of single-use and disposable e-cigarettes. E-cigarette cartridges, such as JUUL pods, are single-use products that



contain plastic, electronic and chemical waste and many of them may also end up as litter. Inexpensive, flavored disposable e-cigarettes such as Puff Bar, which doubled their market share in just 10 months from August 2019 to May 2020,<sup>13</sup> are gaining popularity and further contribute to e-cigarette waste.

## LITTER CIGARETTES

- > Cigarette butts comprise 30%-40% of items collected in annual coastal/urban cleanups.<sup>14</sup>
- > Cigarette butts are the most prominently littered item on U.S. roadways, retail areas, storm drains, loading docks, construction sites and recreational areas.<sup>15</sup>
- > In 2019, **cigarette butts were the most littered item** in U.S. beaches and waterways, with close to a million (900,178) pieces collected.<sup>16</sup>
- > **4,211,962 cigarette butts** were collected on beaches and waterways globally in 2019, making them the world's second most common type of litter after food wrappers.<sup>16</sup>

- > **12,089 cigarette lighters, 58,672 cigar tips and 33,865 tobacco packages** or wrappers were removed from U.S. waterways in 2015.<sup>18</sup>
- > 86% of smokers consider cigarette butts to be litter, but **75% of smokers throw them on the ground or out of a car window.**<sup>19</sup>
- > Smokers litter as many as 65% of their cigarette butts.<sup>5</sup>

## E-CIGARETTES

- > **E-cigarette-related waste is potentially a more serious environmental threat than cigarette butts** because it contains metal, circuitry, single-use plastic cartridges, batteries and toxic chemicals in e-liquids.<sup>20,21</sup>
- > **E-cigarette manufacturers do not provide guidance to consumers on how to dispose of used devices or pod/cartridge products,** and there are no receptacles or specific processes in place.<sup>21</sup>
- > A Truth Initiative survey found that almost half (46.9%) of e-cigarette device owners said that the e-cigarette/vape device they currently use **does not provide** any disposal information such as where to send used

E-cigarette manufacturers do not provide guidance to consumers on how to dispose of used devices or pod/cartridge products

batteries or empty pods. The survey also found that more than half (57.8%) of those who had vaped in the past 30 days **found it inconvenient to dispose of e-cigarette waste responsibly.**

## BIODEGRADABILITY

### CIGARETTES

Cigarette filters are made from cellulose acetate, a plastic which only degrades under severe biological circumstances, such as when filters collect in sewage. In practice, **cigarette butts tossed on streets and beaches do not biodegrade.**<sup>7,22</sup>

- > Under optimal conditions, it can take at least **nine months for a cigarette butt to degrade.**
- > The sun may break cigarette butts down, but only into smaller pieces of waste which dilute into water/soil.<sup>6,7,23</sup>

Growing **concerns over the impact of tobacco waste** on the environment, as well as the substantial costs of cleanup, have prompted states, municipalities and institutions to enact a variety of policy actions. For example, **317 municipalities prohibited smoking on beaches<sup>24</sup> and 1,531 prohibited smoking in parks as of October 2017.**<sup>25</sup>

### E-CIGARETTES

Unlike cigarette butts, e-cigarette waste cannot biodegrade even under severe conditions. E-cigarette cartridges discarded on streets mix with leaf litter and get pushed around by weather events, eventually breaking down into microplastics and chemicals that flow into storm drains to pollute waterways and wildlife.<sup>8</sup> The DEA advises to contact local waste departments about their household hazardous waste (HHW) program to see if they accept e-cigarettes, and if that is not an option, remove the battery (if possible) and bring the battery to recycling. After the battery has been removed, the rest of the e-cigarette can be brought to DEA prescription take-back days.<sup>42</sup>

## LAND, COASTAL AND WATER POLLUTION

Cigarette and e-cigarette waste can pollute soil, beaches and waterways. Studies have also shown that cigarette and e-cigarette waste is harmful to wildlife.

### CIGARETTES

- > Cigarette butts cause **pollution** by being carried, as runoff, to drains and from there to rivers, beaches and oceans.<sup>6</sup>
- > Preliminary studies show that **organic compounds** (such as nicotine, pesticide residues and metal) **seep from cigarette butts into aquatic ecosystems**, becoming acutely **toxic** to fish and microorganisms.<sup>9,11</sup>
- > In one laboratory study, the chemicals that leached from a single cigarette butt (soaked for 24 hours in a liter of water) released enough toxins to kill **50 percent of the saltwater and freshwater fish** exposed to it for 96 hours.<sup>11</sup>
- > Another laboratory study found that cigarette butts can be a source for **heavy metal contamination in water**, which may harm local organisms.<sup>26</sup>
- > A study of the effects of **roadside waste on soil** found that patterns of hydrocarbon levels in the soil were similar to those of littered cigarette butts. This indicates that the chemicals in the soil had seeped out of cigarette butts. **Some hydrocarbons are carcinogenic.**<sup>9-11</sup>

### E-CIGARETTES

- > Both the batteries and e-cigarette devices contain **hazardous substances such as lead and mercury.**<sup>27</sup>
- > Lithium-ion batteries in e-cigarettes have been known to explode and cause fires in garbage trucks and waste management plants if damaged or exposed to extreme



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heat.<sup>27</sup> **According to a California survey, 56% of the fires at waste facilities between 2016-2018 were reported to have been caused by batteries, mostly lithium-ion ones.**<sup>28,29</sup>

- > Incompletely used liquid cartridges and refills **contain nicotine salts and heavy metals, which can leach into soil and waterways or be ingested by wildlife.**<sup>29</sup>
- > Before lithium-ion batteries can be placed in the trash, they need to be **fully discharged and cooled, submerged in cold saltwater for two weeks** — covered securely with a lid — **and wrapped in newspaper.**<sup>42</sup>

## GROWING AND MANUFACTURING TOBACCO PRODUCTS

- > **813,925 pounds of toxic chemicals<sup>30</sup>** were released from U.S. tobacco facilities in 2018. This number is down **from 1,312,796 pounds in 2015<sup>31</sup>** likely in part due to the decline in cigarette smoking and the industry's shifting focus to newer electronic products.
- > Research has found that **growing tobacco contributes to deforestation**, especially in the developing world.<sup>32</sup> **Deforestation for tobacco plantations promotes soil degradation and "failing yields"** or the capacity for the land to support the growth of any other crops or vegetation.<sup>1</sup>
- > Tobacco farmers typically clear land by burning it. But this land is often agriculturally marginal and is abandoned after only a few seasons, **contributing in many cases to desertification.**<sup>1</sup> Burning increases **greenhouse gas levels** by generating water and air pollutants, and decreasing forest cover<sup>1</sup> which would otherwise absorb the 16 million metric tons of CO<sub>2</sub> produced by tobacco production. **Shutting down the tobacco industry would equate to taking 16 million cars off the streets every single year.**<sup>33</sup>
- > **Tobacco production uses up more water and wood, and has more pesticides applied to it, than most other crops**, further affecting water supplies and contamination of the soil.<sup>1</sup>

## CIGARETTES

- > Approximately **600 million trees are chopped down every year by the tobacco industry.**<sup>43</sup> On average each tree produces enough paper for 15 packs of cigarettes.<sup>14</sup>
- > Tobacco farming and the tobacco industry are a sizeable contributor to deforestation in many countries around the world.<sup>14</sup>

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## E-CIGARETTES

- > Since e-cigarettes quickly rose in popularity in an under-regulated environment, we know little about how e-cigarettes are manufactured and the environmental impact of the production process. Thus far, research and policy on e-cigarettes has focused on the youth epidemic and **lack of regulation rather than the product's environmental impact.**
- > E-cigarette companies were **required to submit information by September 9, 2020 on the environmental impact of their products as part of applications** to the Food and Drug Administration to keep their products on the market, but this information is not yet publicly available.<sup>34</sup>

## INDUSTRY ACCOUNTABILITY FOR TOBACCO WASTE

- > Many e-cigarette manufacturers simply direct users to hazardous waste/electronic waste disposal companies, which **often don't accept e-cigarettes.**<sup>35</sup>
- > From the cellulose acetate of cigarette butts to e-liquid residue and batteries, waste management and hazardous waste **disposal plants are not currently equipped to handle either type of waste.** Federal regulations have not yet caught up to the need for guidance on disposal.
- > Starting in 2019, the Drug Enforcement Agency (DEA) began accepting e-cigarette devices and cartridges during their annual National Prescription Take Back Day, although the DEA cannot accept devices containing lithium ion batteries.<sup>35</sup>

- Currently, there is no industry guideline for recycling e-cigarettes in the U.S and no documented baseline standards for end-of-life disposal by manufacturers.<sup>35</sup> There is **no requirement in place to hold manufacturers accountable** for the post-consumer waste they helped produce or to devise a clear and safe system to dispose of these items as hazardous materials or e-waste.<sup>27,36</sup>
- Even though **guidance exists on best practices** for holding companies like tobacco manufacturers accountable for reducing or disposing of the post-consumer waste that results from use of their products, **they are not currently enforced across the industry by any governing body including the Environmental Protection Agency.**<sup>3,38</sup>
- **States and local agencies that have the authority to enforce hazardous waste penalties can help reduce the environmental impact.** As of January 2020, the EPA states that, violators of hazardous waste requirements **can incur civil penalties of up to \$75,867 per day.**<sup>37</sup> In 2006, **Washington state** became one of the **first states in the nation to pass a law putting the responsibility for recycling e-waste on the producer**, not taxpayers. Manufacturers that produce electronics were required to pay for and manage their recycling.<sup>37</sup>

Tobacco manufacturers need to be held responsible for the extreme amounts of waste that their products create



## TOBACCO INDUSTRY NEGLIGENCE

The tobacco industry is responsible for producing much more than tobacco products — they are guilty of creating hundreds of thousands of pounds of cigarette and e-cigarette waste each year. Cigarette and e-cigarette waste present serious threats to the ecosystem and requires a long-term solution. Instead of accepting responsibility for their products, tobacco companies are using the environmental problems associated with tobacco products as a ploy for positive press attention.

Some tobacco companies have included reducing the amount of cigarette butts in the environment as part of their **sustainability goals**. For example, *American Spirit* continues its “inspirational” themed environmental messaging in 2021 with a new **“Stronger Together”** slogan and reaffirmation of their goal to help recycle a half-billion cigarette butts by 2025,<sup>39</sup> and Philip Morris International claims it endeavors to reduce plastic litter from its products by 50% from 2021 to 2025 as part of its “Our World Is Not an Ashtray” initiative.<sup>40</sup> Campaigns like this are **hypocritical and misleading to the public**. The tobacco industry not only created this new waste stream in the first place, they are trying to **cover up their harmful practices** through misdirection and public displays of eco-activism.

## POLICIES TO PROTECT THE ENVIRONMENT

**Tobacco manufacturers need to be held responsible for the extreme amounts of waste that their products create** and to **facilitate the environmentally safe disposal of their products — both combustible and electronic**. Strong local regulations coupled with financial penalties to reduce the amount of e-cigarette waste are needed to reduce the negative environmental consequences from their products.<sup>40</sup> Increasing consumer awareness of the environmental toxicity and dangers posed by discarding cigarette<sup>6</sup> and e-cigarette related waste into landfills<sup>41</sup> and encouraging smokers and vapers to quit using these products altogether are the best ways to protect the environment from tobacco product waste.

## REFERENCES

- 1 Tobacco Atlas. Environment. <https://tobaccoatlas.org/topic/environment/>. Published 2020. Accessed August 5, 2020.
- 2 Stigler-Granados P, Fulton L, Nunez Patlan E, Terzyk M, Novotny TE. Global Health Perspectives on Cigarette Butts and the Environment. *Int J Environ Res Public Health*. 2019;16(10):1858.
- 3 Environmental Protection Agency. Basic Information about Electronics Stewardship. <https://www.epa.gov/smm-electronics/basic-information-about-electronics-stewardship>. Published 2020. Accessed.
- 4 Federal Trade Commission Cigarette Report for 2018 2019.
- 5 Research A. *Littering Behavior in America - Results of a National Study*. Keep America Beautiful;2009.
- 6 Novotny TE, Lum K, Smith E, Wang V, Barnes R. Cigarettes butts and the case for an environmental policy on hazardous cigarette waste. *Int J Environ Res Public Health*. 2009;6:1691-1705.
- 7 Luke JA. Degradability of Filter Materials and Plastics Packaging. Impact of Environmental Regulations on Packing and Product Web site. <http://legacy.library.ucsf.edu/tid/rvj95a99/pdf>. Published 1991. Accessed.
- 8 Mock J, Hendlin YH. Notes from the Field: Environmental Contamination from E-cigarette, Cigarette, Cigar, and Cannabis Products at 12 High Schools—San Francisco Bay Area, 2018–2019. *Morb Mortal Wkly Rep*. 2019;68(40):897.
- 9 Micevska T, Warne MS, Pablo F, Patra R. Variation in, and causes of, toxicity of cigarette butts to a cladoceran and microtox. *Arch Environ Contam Toxicol*. 2006;50(2):205-212.
- 10 Register K. Cigarette Butts as Litter-Toxic as Well as Ugly. *Underwater Naturalist, Bulletin of the American Littoral Society*. 2000;5(2).
- 11 Slaughter E, Gersberg R, Watanabe K, Rudolph J, Novotny TE. Toxicity of Cigarette Butts, and their Chemical Components, to Marine and Freshwater Fish. *Tob Control*. 2011;20:i23-i27.
- 12 Convenience Store News. Convenience Store News Market Research; Nielsen C-store Track. 2019.
- 13 Ali FR DM, Vallone D, et al. . E-cigarette Unit Sales, by Product and Flavor Type — United States, 2014–2020. *Morb Mortal Wkly Rep*. 2020.
- 14 World Health Organization. *Tobacco and its environmental impact: an overview*. Geneva 2017.
- 15 Keep America Beautiful. Littering Behavior in America: Results of a National Study. [http://www.kab.org/site/DocServer/KAB\\_Report\\_Final\\_2.pdf?docID=4581](http://www.kab.org/site/DocServer/KAB_Report_Final_2.pdf?docID=4581). Published 2009. Accessed.
- 16 *Together, We are Team Ocean*. Ocean Conservancy;2020.
- 17 Ocean Conservancy. *International Coastal Cleanup 2017 Report*. Ocean Conservancy 2017.
- 18 Ocean Conservancy. International Coastal Cleanup Data Collection & Reporting Tool. *International Coastal Cleanup*. 2015.
- 19 Rath JM, Rubenstein RA, Curry LE, Shank SE, Cartwright JC. Cigarette litter: smokers' attitudes and behaviors. *Int J Environ Res Public Health*. 2012;9(6):2189-2203.
- 20 SIMS Lifecycle Services. A Closer Look: Lithium-Ion Batteries in E-waste. <https://www.simsrecycling.com/2019/05/21/a-closer-look-lithium-ion-batteries-in-e-waste/>. Published 2020. Accessed.
- 21 Krause MJ, Townsend TG. Hazardous waste status of discarded electronic cigarettes. *Waste Manage*. 2015;39:57-62.
- 22 Ishigaki T, Sugano W, Nakanishi A, Tateda M, Ike M, Fujita M. The degradability of biodegradable plastics in aerobic and anaerobic waste landfill model reactors. *Chemosphere*. 2003;54:225-233.
- 23 Hons NS. Photodegradation of Cellulose Acetate Fibers. *J Polym Sci Pol Chem*. 1977;15:725-744.
- 24 American Nonsmokers' Rights Foundation. Municipalities with Smokefree Beach Laws. 2017.
- 25 American Nonsmokers' Rights Foundation. Municipalities with Smokefree Park Laws. 2017.
- 26 Moerman JW, Potts GE. Analysis of Metals Leached from Smoked Cigarette Litter. *Tob Control*. 2011;20(Suppl 1):i30-5.
- 27 Forster M. What happens when you throw away e-cigarettes? <https://missionlocal.org/2018/11/what-happens-when-you-throw-away-an-e-cigarette/>. Published 2018. Accessed.
- 28 Mize J. Batteries cited as cause of Wash. recycling truck fire (reprint). *The Columbian* 2019.
- 29 Hendlin Y. H. (2018). Alert: Public Health Implications of Electronic Cigarette Waste. *Am J Public Health*. 108(11), 1489–1490. <https://doi.org/10.2105/AJPH.2018.304699>
- 30 Environmental Protection Agency. *Chemical Report; TRI Explorer; 2018 Dataset*. EPA2018.
- 31 Environmental Protection Agency. *Chemical Report; TRI Explorer; 2015 Dataset*. EPA2017.
- 32 Geist HJ. Global assessment of deforestation related to tobacco farming. *Tobacco Control*. 1999;8(1):18-28.
- 33 Tobacco Free Life. Smoking Environmental Risks. <https://tobaccofreelife.org/why-quit-smoking/smoking-effects/smoking-environmental-risks/>. Published 2020. Accessed.
- 34 Ebbs S. E-cigarettes highlight the challenges of dealing with plastic waste - Lawmakers announced a new bill to tackle plastic pollution this week. *ABC News*,2020.
- 35 PEGEX. How E-Cigarettes Could Provide a Model for All E-Waste. Hazardous Waste. <https://www.hazardouswasteexperts.com/hazardous-waste-management-e-cigarettes/>. Published 2017. Accessed.
- 36 Chang H. Research gaps related to the environmental impacts of electronic cigarettes. *Tob Control*. 2014;23 Suppl 2(Suppl 2):ii54-ii58.
- 37 Washington Environment Council. Black Friday Goes Green as Manufacturers Help Consumers Recycle. <https://wecprotects.org/black-friday-goes-green-manufacturers-help-consumers-recycle/>. Published 2020. Accessed.
- 38 Leclerc SH, Badami MG. Extended producer responsibility for E-waste management: Policy drivers and challenges. *J Clean Prod*. 2020;251:119657.
- 39 Businesswire. PMI Launches "Our World Is Not an Ashtray" Initiative and Aims to Halve Plastic Litter from Products by 2025. Businesswire 2020.
- 40 Shevchenko T, Laitala K, Danko Y. Understanding Consumer E-Waste Recycling Behavior: Introducing a New Economic Incentive to Increase the Collection Rates. *Sustainability*. 2019;11(9):2656.
- 41 Templeton N. The Dark Side of Recycling and Reusing Electronics: Is Washington's E-Cycle Program Adequate? *Seattle J Soc Justice*. 2008;7(2).
- 42 Framework Convention Alliance. Tobacco: A barrier to sustainable development. March 2015. [http://fctc.wpengine.com/wp-content/uploads/2015/03/Tobacco\\_sustainable\\_development\\_190315.pdf](http://fctc.wpengine.com/wp-content/uploads/2015/03/Tobacco_sustainable_development_190315.pdf)



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